

## Office Action Summary

Application No.

10/533,449

Applicant(s)

KANEDA ET AL.

Examiner

NICOLE T. GUGLIOTTA

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on November 28, 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1, 4 - 6, 8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4 - 6, 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>11/7/2008</u> .                          |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application  |
| Paper No(s)/Mail Date _____.   | 6) <input type="checkbox"/> Other: _____.                          |

## DETAILED ACTION

### *Examiner's Note*

1. Examiner acknowledges the amendment to claim 1 and the cancellation of claims 2 – 3, 7, and 9 – 23.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4 – 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishihara et al. (EP 1251247 A1, provided by Applicants), in view of Stobbe et al.(WO 00/01463).
4. In regard to claims 1 and 4, Applicants contend “since a porosity of the plugging material is set to 97% or more of a porosity of the cell wall, the Young’s modulus of the plugging material becomes lower than that of the cell wall” (Specification, Page 6, Lines 2 – 5).
5. Ishihara et al. disclose a porous diesel exhaust filter molded into the form of a honeycomb, with a porosity of the cells walls of 55% and a porosity of the plugs of 70% (Table 1, Samples 7 - 9 and 13- 15). Therefore, as described by

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Applicants, the sealers, or plugging material, will inherently have a Young's modulus lower than that of the cell walls.

6. Ishihara et al. disclose a diesel exhaust gas filter, also molded into the form of a honeycomb, including the plugging material, was made of cordierite, not silicon carbide.

7. Stobbe et al. disclose a diesel exhaust gas filter, molded in to a honeycomb structure, with plugs (Page 17, Lines 11 – 13). The honeycomb is a porous structure composed primarily of silicon carbide. Stobbe et al. disclose the advantages of silicon carbide over cordierite include (1) a higher thermal conductivity, which yields a higher thermal shock resistance (the decomposing point of silicon carbide is higher than the melting point of cordierite), (2) a higher strength material, and when the pore size is controlled, the permeability of silicon carbide was higher than that of cordierite (Page 17, Lines 16 - 29).

8. It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute silicon carbide for cordierite as the material of choice in a honeycomb used as a diesel exhaust filter because of the many advantages silicon carbide has over cordierite as a material for exhaust filters used at high temperatures, such as a higher thermal shock resistance, higher strength, and higher permeability for filtering, as taught by Stobbe et al.

9. In regard to claim 5, Ishihara et al. disclose cell walls of 0.2 mm (200  $\mu$ m) thickness (Section [0031]).

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10. In regard to claim 6, Ishihara et al. disclose the honeycomb structure to be made from a ceramic material (Section [0028]), with cells walls of 55% porosity (Section [0031]).

11. In regard to claim 8, Ishihara et al. disclose the cordierite material is placed at the end of selected cells so as to form the plugs. The plugs were arranged in checker work pattern (Section [0029]).

12. Claims 1, 4 - 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa et al. (U.S. Patent No. 5,595,581), in view of Stobbe et al.(WO 00/01463).

13. In regard to claim 1, Applicants contend "since a porosity of the plugging material is set to 97% or more of a porosity of the cell wall, the Young's modulus of the plugging material becomes lower than that of the cell wall" (Specification, Page 6, Lines 2 – 5).

14. Ichikawa et al. disclose a honeycomb exhaust filter in which the porosity of the sealing members (corresponds to Applicants' "plugging material") of the exhaust gas filters is desired to be 110 – 140% of the porosity of the above honeycomb structure (corresponds to Applicants' "cell wall"), for maintaining a high collection efficiency and decreasing pressure losses (Col. 2, Lines 31 – 36).

15. Ishikawa et al. disclose the sealer of the sealing members of ceramic fibers, cordierite particles, LAS (lithium aluminosilicate) may be employed (Col. 6,

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Lines 21 - 24). Ishikawa et al. is silent in regard to the use of silicon carbide in the sealing members.

16. Stobbe et al. disclose a diesel exhaust gas filter, molded in to a honeycomb structure, with plugs (Page 17, Lines 11 – 13). The honeycomb is a porous structure composed primarily of silicon carbide. Stobbe et al. disclose the advantages of silicon carbide over cordierite include (1) a higher thermal conductivity, which yields a higher thermal shock resistance (the decomposing point of silicon carbide is higher than the melting point of cordierite), (2) a higher strength material, and when the pore size is controlled, the permeability of silicon carbide was higher than that of cordierite (Page 17, Lines 16 - 29).

17. It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute silicon carbide for cordierite as the material of choice in a honeycomb used as a diesel exhaust filter, such as that disclosed by Ichikawa et al., because of the many advantages silicon carbide has over cordierite as a material for exhaust filters used at high temperatures, such as a higher thermal shock resistance, higher strength, and higher permeability for filtering, as taught by Stobbe et al.

18. In regard to claims 4 and 6, Stobbe et al. disclose the porosity of the filtering wall is in the interval of 30 – 90% (Pg. 28, Claim 32).

19. In regard to claim 5, Ichikawa et al. disclose a cell wall thickness of 430  $\mu\text{m}$  (Col. 4, Lines 33 – 35). While the disclosure of the cell wall thickness

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disclosed by Ichikawa et al. is not within Applicants' claimed range, the Examiner places the burden upon the Applicants to demonstrate the patentable difference between 400  $\mu\text{m}$  and 430  $\mu\text{m}$  for a honeycomb exhaust filter cell wall thickness.

20. In regard to claim 8, Ichikawa et al. disclose cells that are plugged in an alternating manner so as to form checkerboard patterns at the end faces (Figures 1 - 3). Therefore, as described by Applicants, the sealers, or plugging material, will inherently have a Young's modulus lower than that of the cell walls.

21. Claims 1, 4 – 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stobbe et al., in view of Ishihara et al.

22. In regard to claims 1, 4, and 6, Stobbe et al. disclose a porous honeycomb exhaust filter with plugs, composed of silicon carbide (Example 1, Pg 16, Line 28 – Pg 17, Line 3). Stobbe et al. disclose the porosity of the filtering wall is in the interval of 30 – 90% (Pg. 28, Claim 32).

23. Ishihara et al. disclose porosity of the walls is 55% and the porosity of the plugs is 70% (Section [0031]). Such porosity differences improve the purifying performance by utilizing the plugs as part of the filter (Sections [0015] & [0035]).

24. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the honeycomb exhaust filter of Stobbe et al. by adjusting the porosity of the plugs relative to the cells in order to use the plugs for

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additional filtration and therefore improve purifying performance, as taught by Ishihara et al.

25. In regard to claim 5, Ishihara et al. disclose cell walls of 0.2 mm (200  $\mu$ m) thickness (Section [0031]).

26. In regard to claim 8, Stobbe et al. disclose

Each channel is closed in one end and neighbouring channels are closed at alternate ends, forming a chess-board like pattern, generating a Wall Flow Filter" (Page 17, Liners 11 - 13).

27. Claims 1, 4 – 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stobbe et al., in view of Ichikawa et al.

28. In regard to claims 1, 4, and 6, Stobbe et al. disclose a porous honeycomb exhaust filter with plugs, composed of silicon carbide (Example 1, Pg 16, Line 28 – Pg 17, Line 3). Stobbe et al. disclose the porosity of the filtering wall is in the interval of 30 – 90% (Pg. 28, Claim 32).

29. Ichikawa et al. disclose

the porosity of the above first sealing members of the exhaust gas filters s desired to be 110 – 140% of the porosity of the above honeycomb structure, for maintaining a high collection efficiency and decreasing pressure losses (Col. 2, Lines 31 – 26).

30. Examiner notes the "sealing members" of Ichikawa et al. correspond to Applicants' "plugging material." Based upon the teachings of Ichikawa et al, it would have been obvious to one of ordinary skill in the art at the time of the

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invention that the collection efficiency and pressure losses of the honeycomb exhaust filter disclosed by Stobbe et al. would be improved by increasing the porosity of the plugging material to as much as 140% of the cell walls of the honeycomb structure.

31. In regard to claim 5, Ichikawa et al. disclose a cell wall thickness of 430  $\mu\text{m}$  (Col. 4, Lines 33 – 35). While the disclosure of the cell wall thickness disclosed by Ichikawa et al. is not within Applicants' claimed range, the Examiner places the burden upon the Applicants to demonstrate the patentable difference between 400  $\mu\text{m}$  and 430  $\mu\text{m}$  for a honeycomb exhaust filter cell wall thickness.

32. In regard to claim 8, Stobbe et al. disclose

Each channel is closed in one end and neighbouring channels are closed at alternate ends, forming a chess-board like pattern, generating a Wall Flow Filter" (Page 17, Lines 11 - 13).

### ***Response to Arguments***

#### **Rejections Under 35 U.S.C. 102**

##### **A. Suwabe**

33. Applicants argue, "Suwabe is not available as prior art against the instant claims. The present application claims priority benefit of JP 2002-323271, filed on November 7, 2002. Submitted herewith is, upon information and belief, an accurate translation of JP 2002-323271. As is evident from the translation of JP 2002-323271 attached hereto, the pending claims are fully supported by JP



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2002-323271. Accordingly, the pending claims are entitled to the benefit of the November 7, 2002 filing date of JP 2002-323271" (Remarks, Pgs 3 - 4).

34. Applicants' arguments, see Remarks, filed November 28, 2008, with respect to Suwabe have been fully considered and are persuasive. The rejection of Suwabe has been withdrawn.

***B. Ishihara***

35. Applicants argue, "claim 1 is amended to contain the subject matter of canceled claim 7, which was not rejected...over Ishihara. Claims 4 - 6 and 8 depend from claim 1 and, thus, also are not anticipated by Ishihara" (Remarks, Pg 4).

36. Applicants' arguments with respect to claims 1 - 6 and 8 have been considered but are moot in view of the new ground(s) of rejection.

***C. Ichikawa***

37. Applicants argue, "claim 1 is amended to contain the subject matter of canceled claim 7, which was not rejected...over Ichikawa. Claim 8 depends from claim 1 and, thus, also are not anticipated by Ishihara" (Remarks, Pg 4).

38. Applicants' arguments with respect to claims 1 - 3 and 8 have been considered but are moot in view of the new ground(s) of rejection.

***Rejections Under 35 U.S.C. 103(a)***

***A. Hamanaka***

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39. Applicants argue, "the Office Action acknowledges that Hamanaka is silent regarding the porosity of the plugging material relative to the cell wall.

Additionally, Hamanaka teaches that the filler material must be present with a slit that is only partially filled with filler to form a gap. Specifically, paragraph [0024] of Hamanaka indicates that the gap is necessary to prevent the generation of cracks even when non-uniform temperature distribution arises in various portions of the filter. Hamanaka does not teach that prevention of cracks may be accomplished with the filler substance alone" (Remarks, Page 5).

40. Applicants' arguments, see Remarks, filed November 28, 2008, with respect to Hamanaka have been fully considered and are persuasive. The rejection of Hamanaka has been withdrawn.

### ***Conclusion***

41. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

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calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE T. GUGLIOTTA whose telephone number is (571)270-1552. The examiner can normally be reached on M - F 8:30 - 6 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

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Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/  
Supervisory Patent Examiner, Art Unit 1794

NICOLE T. GUGLIOTTA  
Examiner  
Art Unit 1794